REMARKS

At the time of the Office Action dated August 23, 2004, claims 1-10 were pending, all of which stand rejected.

In this Amendment, claim 1 has been amended to recite the limitations "a magnetic layer with a thickness of not greater than 250nm," "an electrically insulative layer with a thickness of 1 to 50nm" and "a multi-layer structure having at least two layers of the magnetic layers." Care has been exercised to avoid the introduction of new matter. Adequate descriptive support for this amendment can be found on, for example, page 32, line 11; page 34, lines 7-8; and page 35, lines 3-4 of the specification.

Claims 1-10 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Sato et al. or Yoshida et al. in view of Wang et al.

In the statement of the rejection, the Examiner asserted that the proposed combination of Sato et al. and Wang et al. and the another combination of Yoshida et al. and Wang et al. would have taught a board for printed wiring including all the limitations recited in claims 1-10.

It is well settled that to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Based on this legal tenet, Applicants submit that Sato et al. and Wang et al., and Yoshida et al. and Wang et al., either individually or in combination, would not have suggested a board including an electromagnetic wave absorbing laminate recited in independent claim 1, as amended. Specifically, the references do not teach or suggest the following limitations in claim 1: a magnetic layer has a thickness of not greater than 250nm; an electrically insulative

layer has a thickness of 1 to 50nm; and the magnetic layer and the electrically insulative layer are alternately stacked in a multi-layer structure having at least two layers of the magnetic layers.

1. Claimed Invention.

The claimed invention includes an electromagnetic wave absorbing laminate with a multi-layer structure wherein at least two magnetic layers each having a thickness of not greater than 250nm, and the magnetic layers and electrically insulative layers are alternately stacked. Therefore, the electromagnetic wave absorbing characteristic in the high-frequency band of not lower than gigahertz can be improved considerably.

The multi-layer structure of the electromagnetic wave absorbing laminate makes it possible to suppress an eddy current loss and effectively remove a closure domain. This is so because the multi-layer structure of the electromagnetic wave absorbing laminate includes at least two very thin magnetic layers each having a thickness of not greater than 250nm, which are barely greater than an average particle diameter of magnetic particles (1 to 150nm), and the electrically insulative layer which electrically isolate the magnetic layers disposed on the upper and lower sides of the electrically insulative layer.

The average particle diameter of the magnetic particles in the magnetic layer is defined to be 1 to 150nm. Further, the magnetic particles are electrically isolated from each other by an electrically insulative material. Therefore, the respective magnetic particles can maintain the magnetic property and increase electrical resistivity.

As a result, the respective magnetic particles effectively absorb the electromagnetic waves while maintaining a high permeability without losing the magnetic property in the high frequency band of not lower than gigahertz. When an inductive current occurs within the magnetic particles by a high frequency magnetic field and electric field, the respective magnetic particles damp

magnetization associated therewith, whereby the electromagnetic waves can efficiently be absorbed and attenuated.

The reduction of the particle diameters of the magnetic particles, the electrical isolation of the respective magnetic particles by the electrically insulative material and the inclusion of the respective magnetic particles in the thin magnetic layer make it possible to prevent deterioration of the permeability characteristics which may otherwise occur due to displacement current attributable to the multi-layer structure. Therefore, the claimed invention is highly effective for prevention of cross talk of mobile phones to provide countermeasures against EMI.

Further, because the thickness of the magnetic layer is not greater than 250nm, and the thickness of the electrically insulative layer is 150nm, the electromagnetic wave absorbing laminate is of the multi-layer structure, but has a very small thickness. Accordingly, the claimed invention is excellent in space saving (see page 5, line 20 to page 8, line 25 of the specification).

2. The cited references do not teach or suggest the claimed invention.

2-1. Sato et al.

Sato et al. teaches as follows:

a non-conductive soft magnetic layer (2) is disposed onto at least one surface of the conductive support (1);

the soft magnetic layer (2) comprises soft magnetic powder of particles (3) dispersed in an organic binder (4);

the soft magnetic powders of particles (3) are Fi-Ni alloy material and are oxidized at its surface;

the conductive support (1) can be polyimide base member (5) coated with a conductive titanium oxide (8) and organic binder (4); and

the soft magnetic layer (2) is formed onto at least one surface of the coated support (1).

In the statement of the rejection, the Examiner asserted that the conductive titanium oxide (8) in the organic binder (4) is analogous to the adhesive layer of a metal oxide, as recited in claim 1.

Even if the Examiner's above assertion were reasonable (and this is not conceded), Applicants emphasize that Sato et al. does not teach a board for printed wire including the following limitations:

(a) the diameter of the soft magnetic powder particles (3);

(b) the thickness of the soft magnetic layer (2) is not greater than 250nm; and

(c) the multi-layer structure is formed by at least two soft magnetic layers (2) and electrically insulative layers with the thickness of 1 to 50nm being alternatively stacked.

2-2. Yoshida et al.

Yoshida et al. teaches as follows:

a composite magnetic article is composed of magnetic powder and an organic binder;

the magnetic powder is Fe-Ni alloy material and is coated with a metal oxide such as aluminum oxide and situation oxide;

the magnetic powder is mixed and dispersed in the organic binder to form a desired shape;

a real part μ' and an imaginary part μ" of the complex magnetic permeability μ are in the predetermined relationship; and

the magnetic resonance frequency ranges from 10 MHz to 50 MHz.

However, Yoshida et al. is silent on:

(a) the diameter of the magnetic powder particles;

(b) the thickness of the composite magnetic article is not greater than 250nm; and

(c) the multi-layer structure is formed by at least two composite magnetic articles and electrically insulative layers each having a thickness of 1 to 50nm being alternatively stacked.

2-3. Wang et al.

Wang et al. discloses:

an EM shielding assembly comprises a substrate and a layer of a ferrite magnetic material;

the substrate which can be a conductive layer (14, 16) is coated with an insulating material (44, 46) prior to coating of the ferrite magnetic material (24),

the ferrite magnetic material is a nano-magnetic material having an average particle diameter less than 100nm,

the nano-magnetic particle is typically iron, cobalt and/or nickel; and

additional insulating layers can be coated onto the nano-magnetic particle layer.

An assembly (11) in Fig. 2 of Wang et al. is coated by each layer of the nano-magnetic particles 24 on the upper and lower sides thereof, and the assembly 11 includes two layers in total. However, when it comes to the laminating material formed on one surface of the substrate (42) at the center of assembly (11), only one layer of the nano-magnetic particle 24 is laminated on one layer of the insulating material (44, 46)

However, Wang et al. does not disclose a board for printed wiring including the following limitations:

(a) a thickness of the layer of nano-magnetic particles 24 is not greater than 250nm;

(b) a thickness of the layer of the insulating material (44,46) is 1 to 50nm; and

(c) a multi-layer structure is formed by at least two layers of the nano-magnetic particles 24 and electrically insulative layers alternately stacked.

2-4. Combination of the references.

Consideration of the teachings of Sato et al. and Wang et al., and Yoshida et al. and Wang et al., either individually or in combination, would not have taught or suggested a board for printed wiring including all the limitations recited in claim 1, as amended. In more detail, the proposed combinations of Sato et al. and Wang et al., and Yoshida et al. and Wang et al. would not teach or suggest a magnetic layer has a thickness of not greater than 250nm; an electrically insulative layer has a thickness of 1 to 50nm; and the magnetic layer and the electrically insulative layer are alternately stacked in a multi-layer structure having at least two layers of the magnetic layers, recited in claim 1. Accordingly, the proposed combinations of the references do not satisfy the requirement under 35 U.S.C. §103. *See In re Royka, supra.*

3. Dependent Claims 2-10.

If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Accordingly, as claim 1 is patentable for the reasons set forth above, it is submitted that dependent claims 2-10 which respectively depend from claim 1 are also patentable.

Therefore, Applicants respectfully solicit withdrawal of the rejection of claims 1-10 under 35 U.S.C. §103 and favorable consideration thereof.

Conclusion.

Accordingly, it is urged that the application is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an

interview or an Examiner's amendment, Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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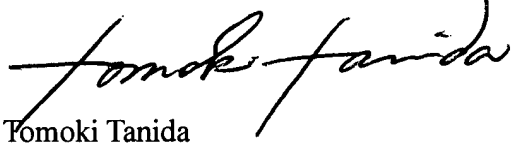

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WDC99 1006817-1.051023.0016